Name: Date:

Polynomial Factoring solution (version 655)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 35 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(35)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 140}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-40}}{2}$$

$$x = \frac{-10 \pm \sqrt{-4 \cdot 10}}{2}$$

$$x = \frac{-10 \pm 2\sqrt{10}\, i}{2}$$

$$x = -5 \pm \sqrt{10}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 - 5i$ and $4 + 6i$ in standard form ($a + bi$).**

Solution

$$(2 - 5i) \cdot (4 + 6i)$$

$$8 + 12i - 20i - 30i^2$$

$$8 + 12i - 20i + 30$$

$$8 + 30 + 12i - 20i$$

$$38 - 8i$$

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3. **Write function $f(x) = x^3 - 3x^2 - 28x + 60$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-3	-28	60
6		6	18	-60
	1	3	-10	0

$$f(x) = (x-6)(x^2+3x-10)$$

$$f(x) = (x-6)(x+5)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5)^2 \cdot (x+1)^2 \cdot (x-2) \cdot (x-5)^2$$

Sketch a graph of polynomial $y = p(x)$.